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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------------------------------------------------------------------------------------------------------------------------------------|-------------|----------------------|---------------------------------|-----------------------------|
| 10/711,280 | 09/07/2004 | Shih-Chang Shei | 10721-US-PA | 5279 |
| 31561 7590 07/12/2007 JIANQ CHYUN INTELLECTUAL PROPERTY OFFICE 7 FLOOR-1, NO. 100 ROOSEVELT ROAD, SECTION 2 TAIPEI, 100 TAIWAN | | | EXAMINER LE, DUNG ANH | |
| | | | ART UNIT 2818 | PAPER NUMBER |
| | | | NOTIFICATION DATE 07/12/2007 | DELIVERY MODE ELECTRONIC |

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

USA@JCIPGROUP.COM.TW

| | | | |
|------------------------------|--------------------------------------|------------------------------------|--|
| Office Action Summary | Application No. 10/711,280 | Applicant(s) SHEI ET AL. | |
| | Examiner DUNG A. LE | Art Unit 2818 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 May 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|-----------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date <u>5/4/2007</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

In view of Amendment dated 5/04/2007. This is a new ground of rejection.

Claims 1 and 6 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Lin et al. (US 2002/0105076) in view of Su et al. (2007/0028445 A1)

Lin teaches bumping process of a LED device (figs. 9-15 and related texts), comprises:

providing a wafer 10 having a plurality of LED chips [0090] and [0004] (diodes as LED devices) thereon, wherein each of the LED chips comprises a plurality of electrodes 33 ([0090]);

forming an UBM (under bump metallurgy) layer 34 on each of the electrodes 33; forming a plurality of posts 35 on the under bump metallurgy layers by a electroplating process [0090]; and

reflowing the posts [0094] and (figs. 13-15 and related texts).

Lin does not teach forming a plurality of posts 35 on the under bump metallurgy layers by a printing process.

Su et al. teach forming a plurality of posts 24 on the under bump metallurgy layers 18 by a printing process [0016], [0021], [0049] and (especially see figure 2C and refer to related text).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to form a plurality of posts on the under bump metallurgy layers by a printing process in Lin 's method in order to ease of applying solder and therefore the resulting better production/revenue would benefit company.

Regarding claim 6, Lin shows wherein a material of the solder posts is selected from the group consisting of tin (Sn), silver (Ag), copper (Cu) [0087] and alloys thereof.

Claims 3- 4 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Lin et al. (US 2002/0105076) in view of Su et al. (2007/0028445 A1) and further in view of Lee (2002/104449).

Regarding claim 3, Lin in view of Su teaches the claimed invention as applied to claim 1 including wherein the printing process comprises the step of applying a solder material onto the pattern plate except for filing the solder material into the openings of the pattern plate by a scraper as cited in current claim 3.

Lee et al. teaches the step of filling the solder material into the openings of the pattern plate by a scraper 200 (para [0022]; figs. 2 and 5 and related texts).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to forming the step of filling the solder material into the of the pattern plate by a scraper in Lin in view of Su 's method, in order to obtain the printing process for simplest application and therefore that would increase production/revenue for company.

Regarding claim 4, wherein after filling the solder material into the openings of the pattern plate, the printing process further comprises removing the pattern plate to form the posts and the solder material in the openings turn into the plurality of the posts 26 (Su, figs. 2C-2D and related texts).

Claims 5 and 7- 8 are rejected under 35 U.S.C. 103 (a) as being unpatentable ver Lin et al. (US 2002/0105076) in view of Su et al. (2007/0028445 A1) and further in view of Lee et al. (US 2003/0134496).

Lin et al. teaches the claimed invention as applied to claim 1 except for a material of the solder posts comprises Sn/Pb alloy as cited in current claim 5.

Lee discloses a material of the solder posts comprises Sn/Pb alloy [0013].

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to apply a material of the solder posts comprises Sn/Pb alloy in Lin in in view of Su 's method, in order to obtain the best desired mechanical characteristic of the solder post.

Regarding claim 7, wherein the step of forming the UBM layers comprises performing electroless plating (Lee 496' in [0011]).

Regarding claim 8, wherein a material of the UBM layer is selected from the group consisting of titanium (Ti), tungsten (W), Chromium (Cr), Nickel (Ni), Copper (Cu), gold (Au) and alloys thereof(Lee 496' in [0011], Su [0011]).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dung A. Le whose telephone number is (571) 272-1784. The examiner can normally be reached on Monday-Tuesday and Thursday 6:00am- 4:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Loke can be reached on (571) 272-1657. The central fax phone numbers for the organization where this application or proceeding is assigned are (571)272-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Dung A. Le/

DUNG A. LE
Primary Examiner
Art Unit 2818